

# 자리 있나요? Empty Seats?

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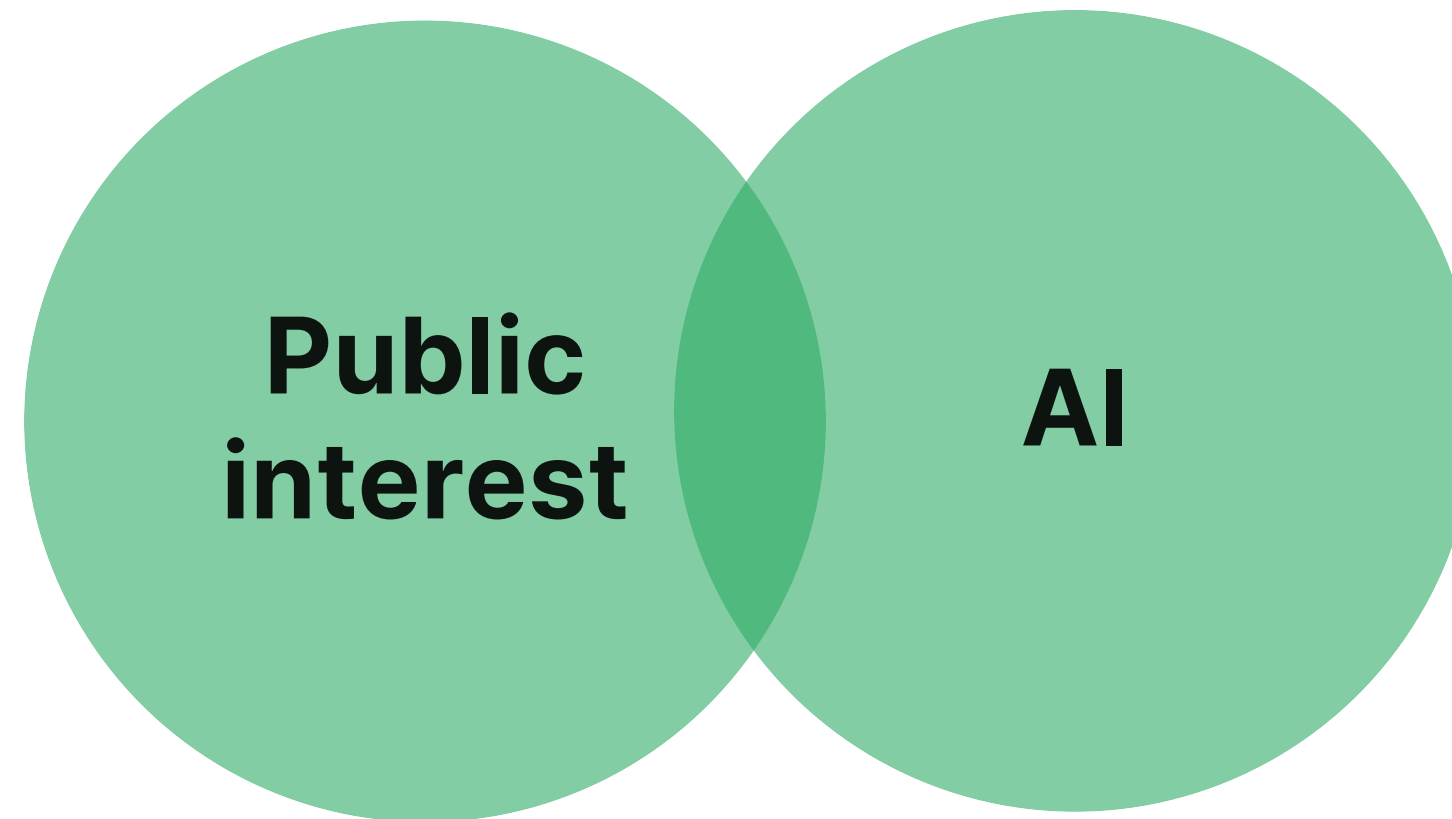
**Related  
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### Goal

Developing a user-friendly **public service** that can promote the **public interest** with AI



Lecture

Dorm

Study  
spaces

Q.

What inconveniences do **SKKU** students feel when using **school facilities**?

# Study Spaces

Samsung library  
book lounge

Haedong  
library

Eskara lounge





# Study Spaces

Samsung library  
book lounge

Haedong  
library


**It's difficult to check if there are any empty seats.**

Eskara lounge

## PART 02 | Problem Statement

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


### 1) School community 'Everytime'


**익명**  
22/03/21 18:22

**디도 북라운지 지금 자리있나요**

한번도 안가봤는데 자리가없는일이 많다고 들어서여..

이 글은 댓글이 달린 이후에는 수정 및 삭제가 불가능하므로, 작성하신 댓글이 삭제될 우려가 없어요. 보다 많은 학우들에게 도움이 될 수 있도록 정성이 담긴 답변을 부탁드립니다.




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**익명**  
06/01 22:07

**공열 발권좀**

아니 공열 발권좀하고 앉자

항상 갈때마다 발권된 자리는 사람이없고 발권 안된자리는 사람  
앉아있네

 0  0  0

## PART 02 | Problem Statement

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### 2) Interview



**Users**

**I went around the school to find empty seats to study.  
I was exhausted because the campus was big.**

**It is difficult to handle users who occupy seats  
and do not use their seats.**

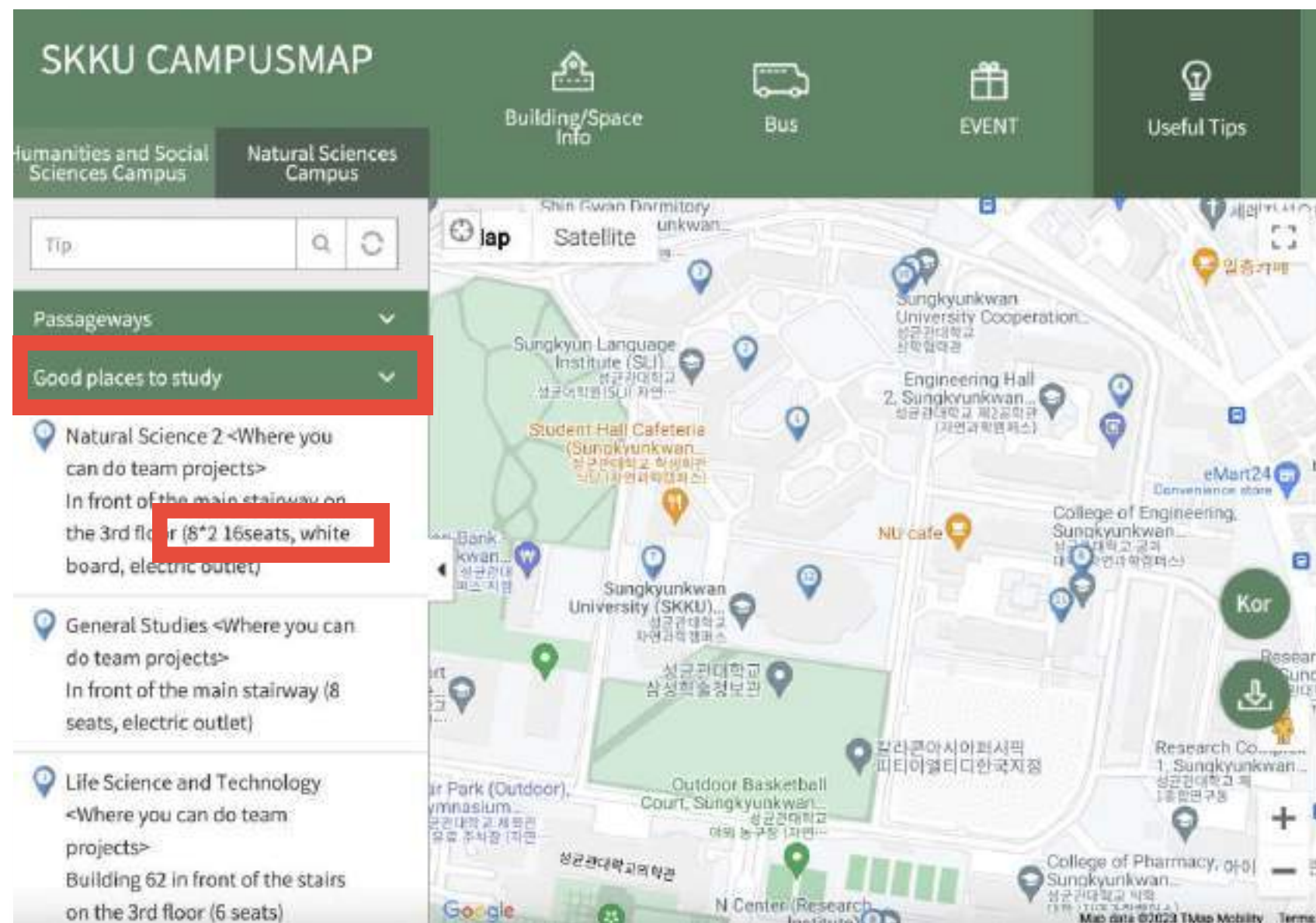


**Manager**



# PART 03 | Related Work

## 1) SKKU CAMPUSMAP



- Introduces good places to study on campus
- Guides the total number of seats in each space
- **Does not tell how many empty seats are available in real-time**

## PART 03 | Related Work

### 2) Haedong Library Reservation System



- No seat usage information other than seminar rooms
- Introduces the inside but does not show the **real-time state**

## Study Spaces Empty Seats?

자리 있나요?

A **web** service that provides **real-time** information  
about **empty seats** in school **study spaces**

Computer  
vision  
model

Database

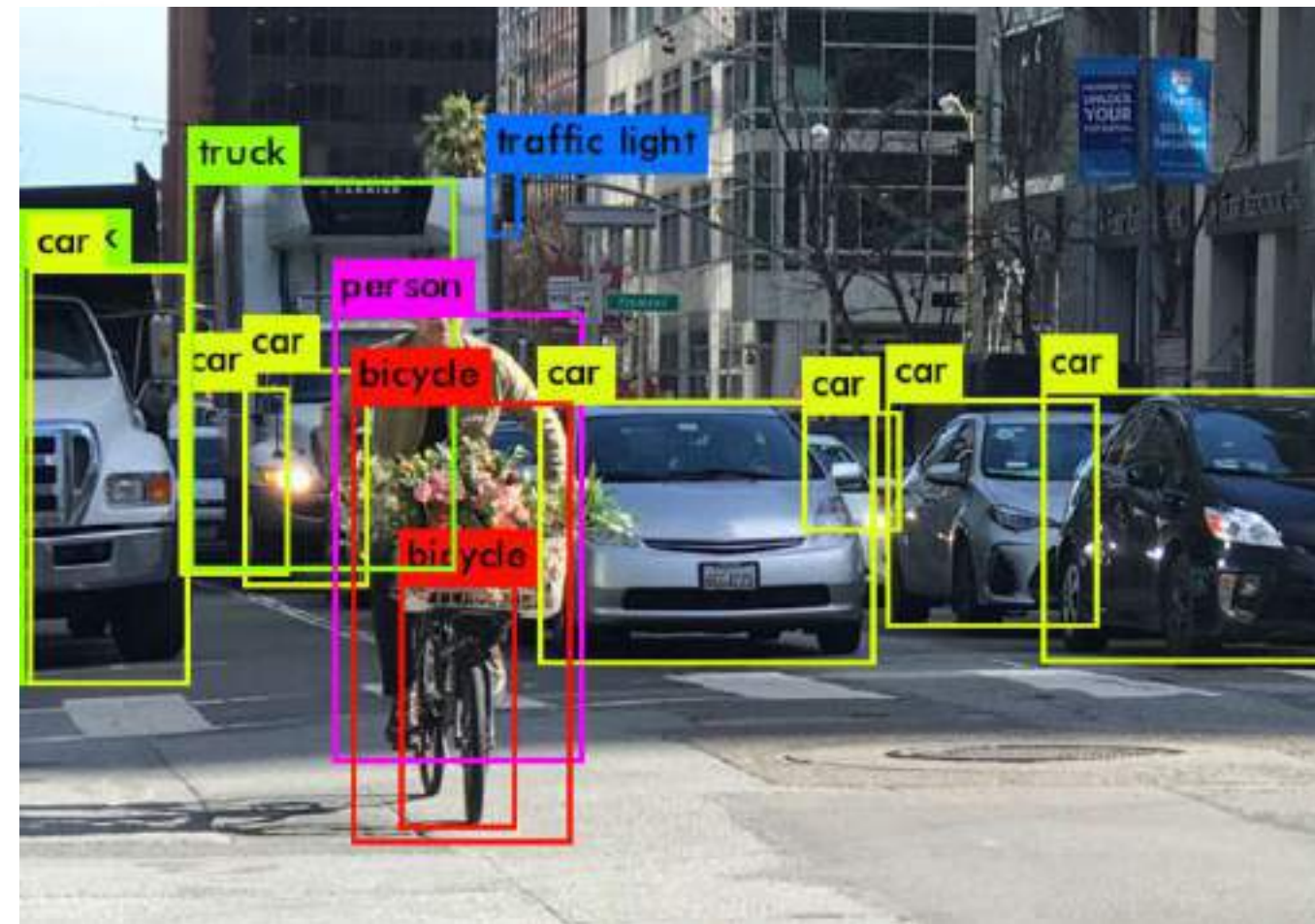
User friendly  
UI / UX



## PART 04 | Proposed Solution

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- Background - Object detection



## PART 04 | Proposed Solution

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- **Background - Object detection**

### Classification



CAT

Determine what  
the objects is

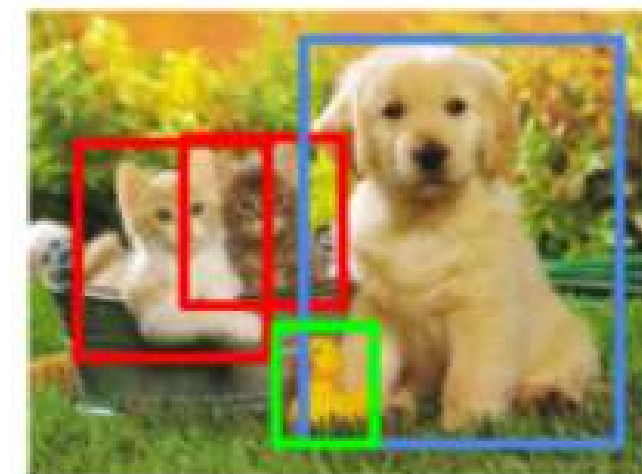
### Classification + Localization



CAT

Display where the  
object is located

### Object Detection



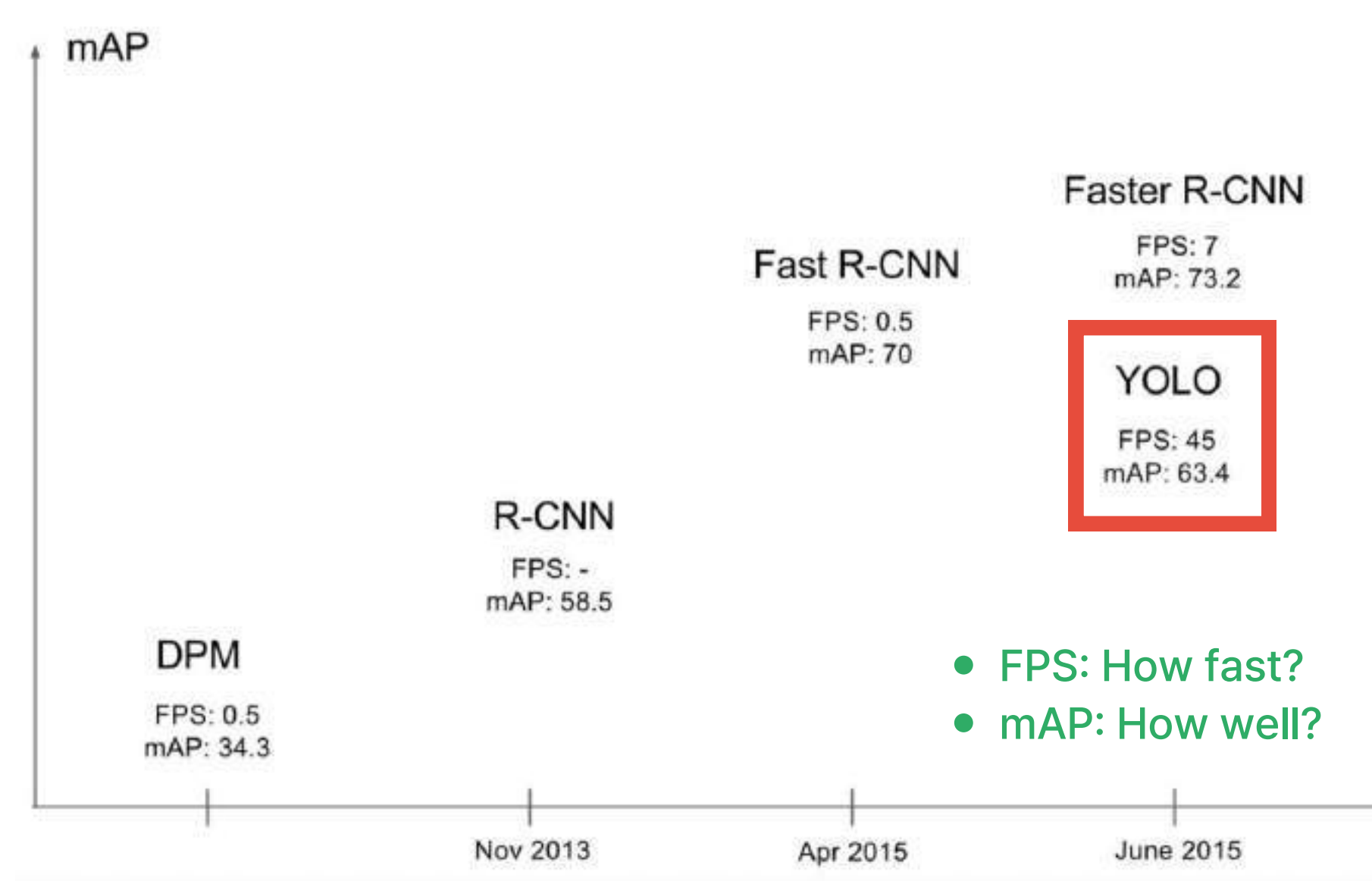
CAT, DOG, DUCK

Classification &  
localization of  
multiple objects



## PART 04 | Proposed Solution

- Background - YOLO



YOLO > Other models

- Much faster
- More accurate



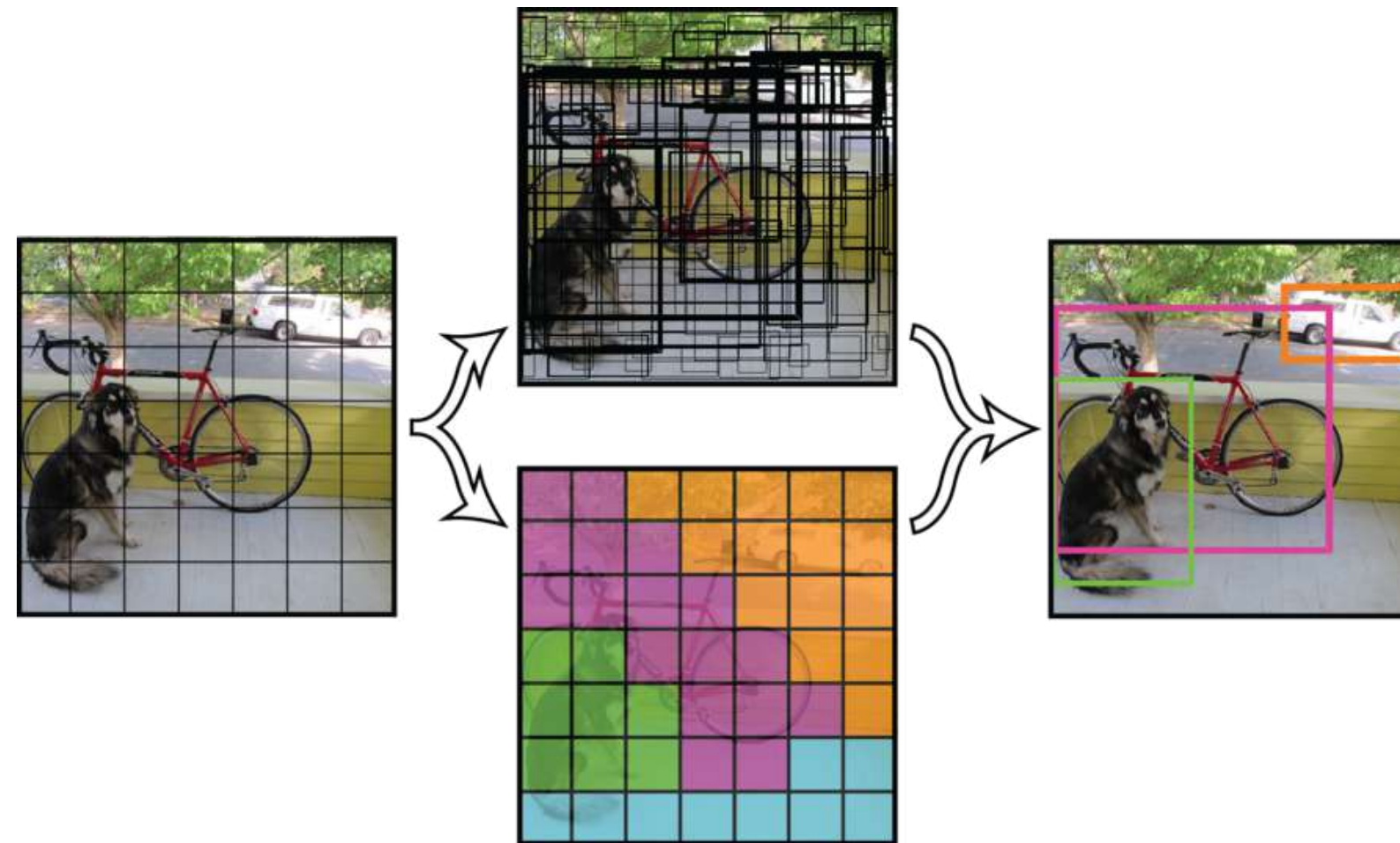
Appropriate for  
real-time object detection

# PART 04 | Proposed Solution

- **Background - YOLO**

Mark the **locations** where the objects are likely to exist with **bounding boxes**

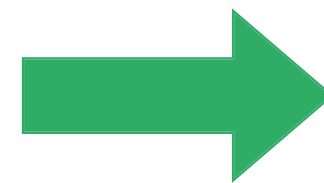
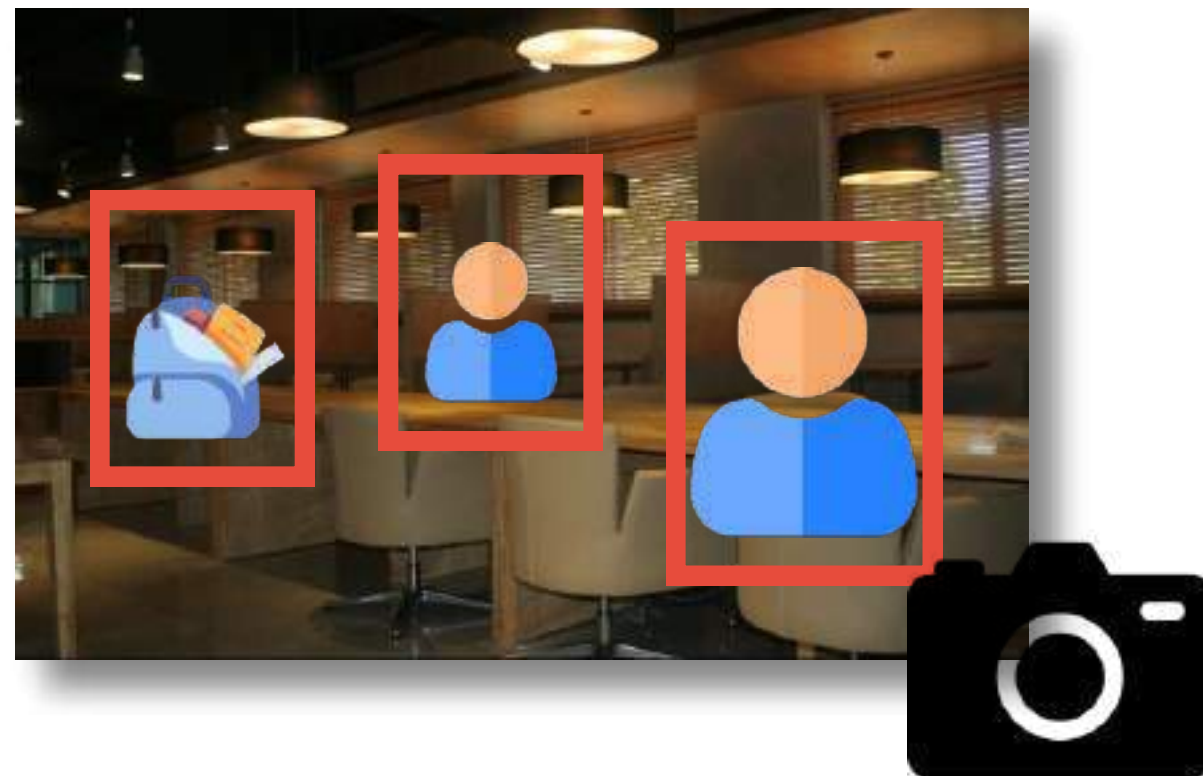
Divid the image into **grids**



Select the **bounding boxes** that are most likely to have an object

Indicates the **class** to which each grid belongs

## PART 04 | Proposed Solution



Website

### Goal

Analyze the real-time seat usage status using **YOLO** and provide the visualized information to the user

# PART 04 | Proposed Solution

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## Users

Users can easily check the empty spaces among the school study spaces.



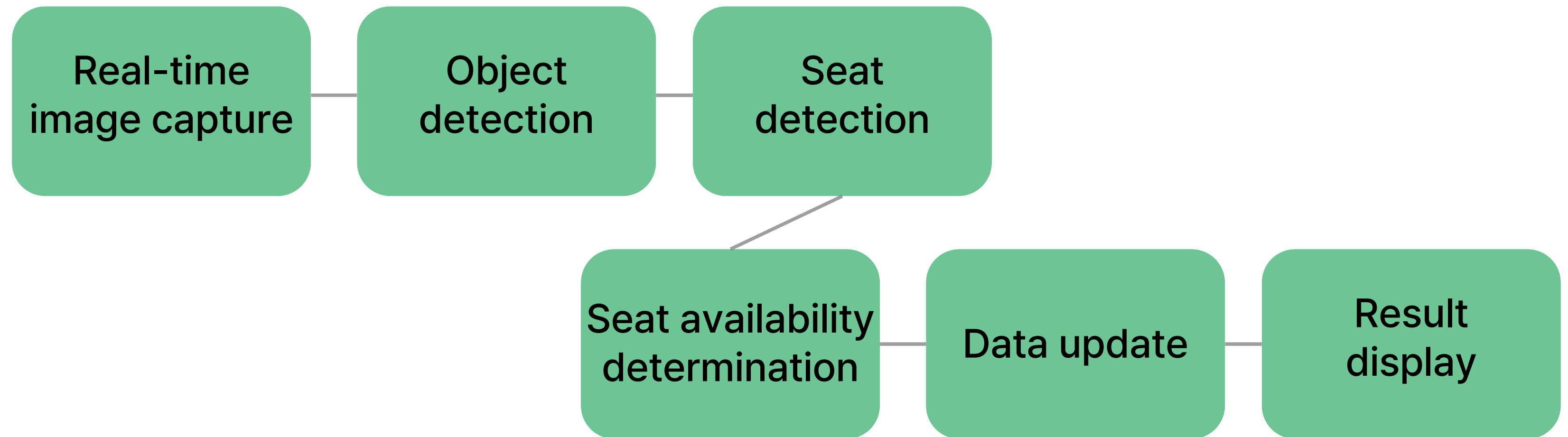
## Managers

Managers can check the condition of the space without visiting the place in person.

## PART 04 | Proposed Solution

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- Procedure



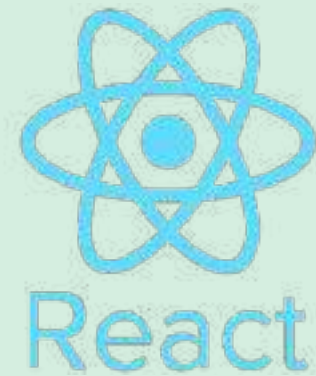


## PART 04 | Proposed Solution

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- Tech stack

### Frontend



### Backend



### Team Collaboration Tool



## PART 04 | Proposed Solution

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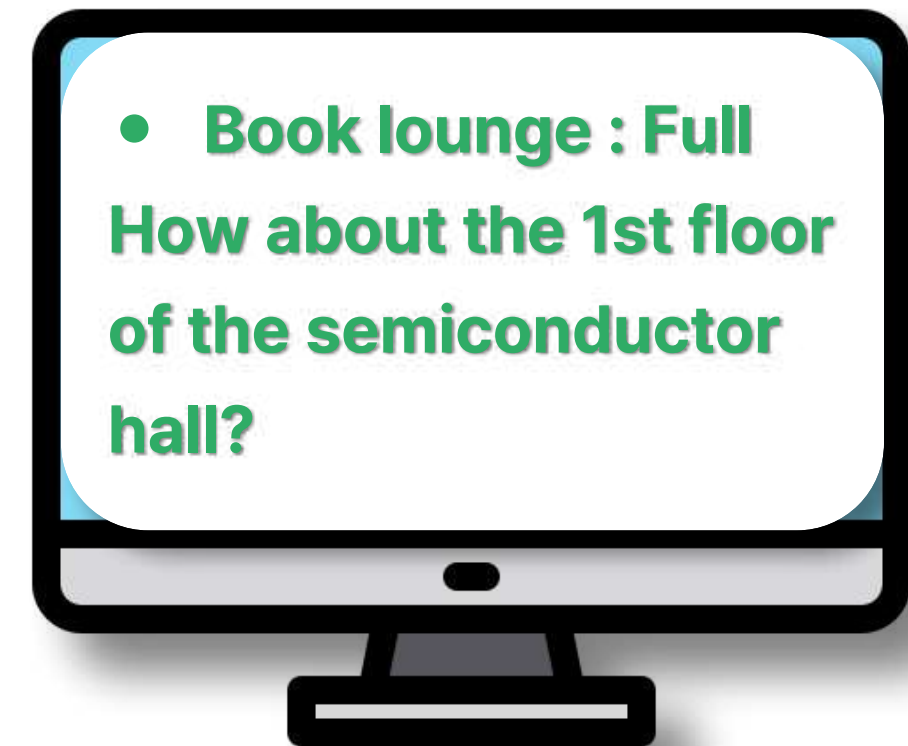
- Idea expansion



Using **CCTV**



Identifying real-time  
**atmosphere**



**Recommending**  
study places

	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Refinement of the Topic														
AI Model Design														
Data Preprocessing														
Model & Algorithm Implementation														
UI & UX Design & Implementation														
Beta Service Launch														
Incorporation of Feedback & Revisions														

AI

김도엽	박재윤	우다연	최지민
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Frontend

박재윤	우다연	최지민
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Backend

김도엽
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# THANK YOU

자리 있나요? Empty Seats? TEAM A (A's) 김도엽 박재윤 우다연 최지민